Endura® NET5301T-I Intelligent Video Encoder

C603M-A (11/07)

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Regulatory Notices

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RADIO AND TELEVISION INTERFERENCE

This equipment has been tested and found to comply with the limits of a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission's rules.

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Video Quality Caution

FRAME RATE NOTICE REGARDING USER-SELECTED OPTIONS

Pelco systems are capable of providing high quality video for both live viewing and playback. However, the systems can be used in lower quality modes, which can degrade picture quality, to allow for a slower rate of data transfer and to reduce the amount of video data stored. The picture quality can be degraded by either lowering the resolution, reducing the picture rate, or both. A picture degraded by having a reduced resolution may result in an image that is less clear or even indiscernible. A picture degraded by reducing the picture rate has fewer frames per second, which can result in images that appear to jump or move more quickly than normal during playback. Lower frame rates may result in a key event not being recorded by the system.

Judgment as to the suitability of the products for users' purposes is solely the users' responsibility. Users should refer to the operation manuals for cautionary statements regarding user selected options and how they might affect video quality. Users shall determine the suitability of the products for their own intended application, picture rate and picture quality. The video analytic behaviors provide a large spectrum of settings that allow the behaviors to be used in a variety of applications. Selection of appropriate settings for proper detection in user applications is the sole responsibility of users. This equipment is intended to assist users in identifying situations of interest to users. Users have the sole responsibility of determining the appropriate response. In the event users intend to use the video for evidentiary purposes in a judicial proceeding or otherwise, users should consult with their attorney regarding any particular requirements for such use.

Description

The NET5301T-I intelligent video encoder is a dual-purpose video encoding unit and video analytics processor. As a video encoder, it converts live analog video into dual MPEG-4 video streams. It can process up to 30 NTSC (25 PAL) images per second (ips) per stream at 4CIF resolution. It transmits these streams over an Ethernet network to other Endura® system components. Then these streams can be recorded on an Endura video recorder or decoded by the following Endura components:

- **NET5301R video decoder:** Converts up to 4 video streams for display.
- **Endura workstation:** Converts up to 16 video streams for display on a computer monitor.
- **VCD5000 video console display:** Converts up to 64 video streams (depending on model) for display.

The NET5301T-I adds a sophisticated video analytics engine to the video encoder function. Once installed and configured, object and activity detection behaviors can interpret activity in the field of view and trigger an alarm when unwanted activity is detected. This ability to process video analytics at the edge conserves network bandwidth; the unit only transmits video streams that have triggered an analytics alarm.

The unit also improves operator effectiveness when monitoring both large and small installations. These sophisticated analysis techniques monitor each frame of video and only alert the operator to cameras and scenes that warrant attention.

Like all Endura encoders, the NET5301T-I incorporates EnduraView™ video optimization technology to select the best image quality and frame rate for the target Endura product (decoder, workstation, console), all without affecting the system recording rate. For example, the unit selects a high rate and quality setting for recording and automatically selects a lower rate for viewing in a multiple view format.

The NET5301T-I can be configured for three alarm inputs and one relay output. When an alarm event is triggered, the unit can send a message to an operator, trigger a relay, and implement video recording.

The NET5301T-I also supports activity detection. You can configure up to three activity zones, each with its own independent sensitivity and threshold settings. When the NET5301T-I detects activity in any of these areas, it can trigger an alarm event.

The unit supports one audio input over the network. The system operator (security personnel) can see and hear activity in the target area.

The NET5301T-I can run in both unsecured and secured modes. The secure mode uses a proprietary key system to prevent unauthorized devices from communicating with a NET5301T-I over the Endura network.

All Endura products support Pelco P/Pelco D and Coaxitron® protocols. As a result, the NET5301T-I supports control of remote peripherals such as pan/tilt/zoom (PTZ) cameras.

OPTIONAL BEHAVIORS

Use this table to create a model number for the desired intelligent encoder behavior and license quantity. For example, NET-LIC-AO-10 is the model number for 10 licenses for the abandoned object behavior. For more information, contact your Pelco sales representative.

NET-LIC-a-b

Behavior
License Quantity

Behavior (a)		Quantity (b)
Vibration Removal	VR	1
Adaptive Motion	AM	5
Abandoned Object	AO	10
Camera Sabotage	CS	25
Object Removal	OR	50
Object Counting	OC	100
Directional Motion	DM	

OPTIONAL MOUNTING ACCESSORIES

RK5100PS-5U	Rack mount with power supply (12 units)
WM5001-4U	Wall mount without power supply (1 unit)

RECOMMENDED POWER SUPPLIES

NET5301PS	Power supply for one encoder (4-pin connector)
TF2000	Power supply for one encoder (2-pin connector)
MCS Series (B model)	Multiple unit power supply, indoor (2-pin connector)

Before You Begin

Endura is a network system that requires a continuous amount of bandwidth to transmit true, live video. Therefore, always include your network administrator when planning and installing Endura components.

You will also need the following items:

- Pelco-approved Endura certification
- Access to an Endura network
    - that is an active, gigabit Ethernet network that supports the full Internet Protocol suite,
    - that is configured with at least one Endura system manager, and
    - that is configured with at least one Endura workstation.

NOTES:

- Many Endura problems are caused by improper installation practices. For best results, make sure your installation meets the power, environmental, and networking guidelines described in the Endura Installation Guidelines and Best Practices document (C2670M).
- When using one or more network switches on the Endura network, enable autonegotiation on all switches.
- These network requirements represent the minimum standard for a small Endura-capable security network. Please consult the Endura Network Design Guide (C1640M) to make sure your network is properly configured. Your system may be different and may require additional hardware, software, and network resources.

PARTS LIST

Qty	Description
1	NET5301T-I video encoder
1	16-pin terminal block
1	2-pin terminal block
1	NET5301T-I Installation manual
1	Safety instructions
1	Pelco badge rotation sticker
4	Rubber feet for desktop installation

NOTE: Since power requirements vary by installation, the NET5301T-I does not include an individual power supply. You can purchase either the optional NET5301PS single-unit power supply or the RK5100PS-5U rack mount, which includes a power supply. Refer to *Connecting Power* on page 25 for more information on supplying power to the NET5301T-I.

USER-SUPPLIED PARTS

In addition to the standard tools and cables required for a video security installation, you will need to provide the following items:

Qty	Description
1	Cat5e (or better) cable and connectors for connecting the NET5301T-I to the Endura network
1	Power supply; refer to *Connecting Power* on page 25 for more information
1	Analog video device (fixed or PTZ camera)
1	Monitor, if using looping video
1	Microphone, if using audio
1	Small flat-tip screwdriver, if connecting camera control, relay, or alarms

You also need to provide all network equipment, such as switches, for the Endura network.

PACKAGE CONTENTS

The following diagram shows the box contents. When installing the NET5301T-I, refer to this diagram.
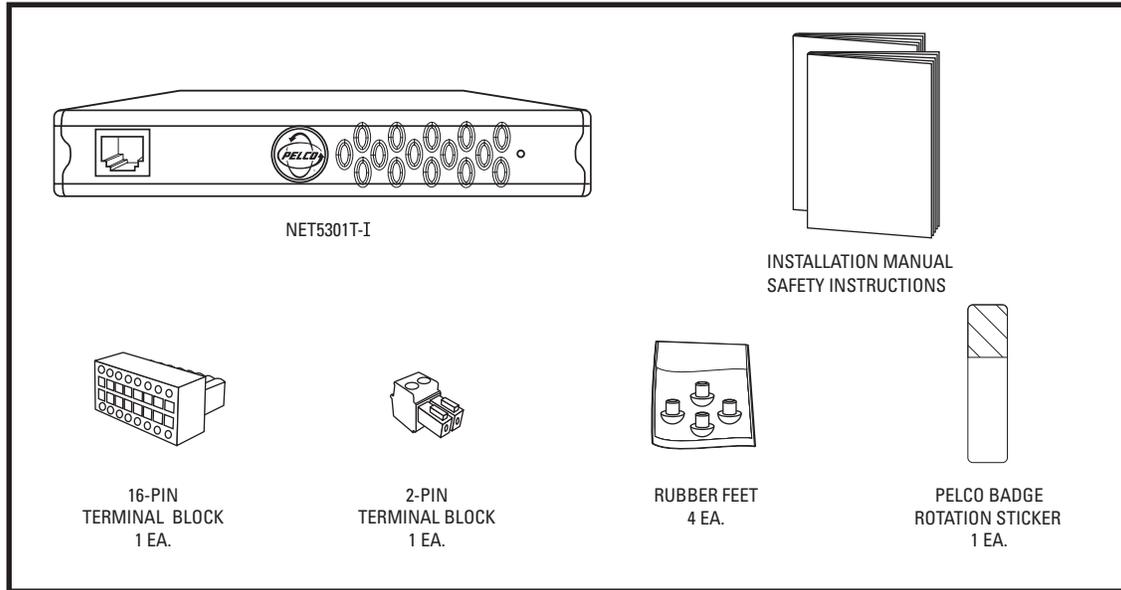
Figure 1. Package Contents

APPLICATION SCENARIO

Figure 2 shows the NET5301T-I video encoder in a sample application scenario.
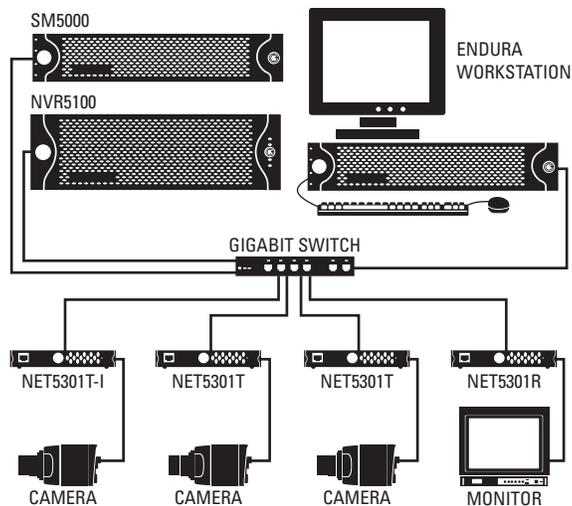
Figure 2. Sample NET5301T-I Application Scenario

IMPORTANT NOTE. PLEASE READ. The network implementation in this document is shown as a general representation only and is not intended to show detailed network topologies. Your actual network will differ, requiring changes or perhaps additional network equipment to accommodate the system as illustrated. Please contact your local Pelco representative to discuss your specific requirements.

PRODUCT SERIAL NUMBER LABEL PLACEMENT

Product serial number labels help Pelco's Product Support identify your system and its factory configuration in case the NET5301T-I or its components require service.

A label citing your product's serial number is attached to the bottom panel of the NET5301T-I. Because rack mounting or other installation options may obscure the factory-applied label, two additional labels are provided. Attach one of them to your product documentation or another product location that will not be obscured by installation. The second label is a spare.

To use these labels:

1. On the bottom panel of your NET5301T-I, locate two small labels, attached with a yellow sticker that reads, "Extra serial number labels: remove prior to installation."

2. Remove the yellow sticker and the labels.

3. Peel away the backing from one label and attach it to this installation manual, other product documentation, or an unobscured product location.
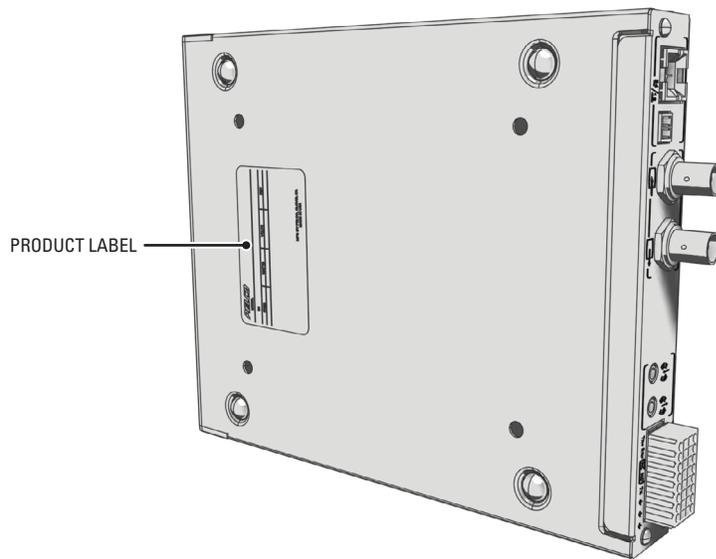
PRODUCT LABEL

Figure 3. Product Serial Number Label

Equipment Placement and Rack Mounting

Use one of the following installation methods for the NET5301T-I:

- Place the NET5301T-I on a flat surface, such as a shelf or desktop.
- Mount the NET5301T-I to a wall using the optional WM5001-4U wall mount kit.
- Install the NET5301T-I in the optional RK5100PS-5U rack mount kit.

NOTES:

- Each installation method, except the RK5100PS-5U, requires the installation of a separate power supply, either the NET5301PS (not supplied) or other equipment supplied by the user (refer to *Connecting Power* on page 25).
- When installing the NET5301T-I on a desktop, use the rubber feet provided with the NET5301T-I to protect the desktop from surface damage. The rubber feet are not needed when mounting the NET5301T-I to a wall or in a rack.

DESKTOP INSTALLATION

To place the NET5301T-I on a flat surface, such as a desktop:

1. Attach the rubber feet to the bottom of the unit to prevent surface damage (refer to Figure 4).
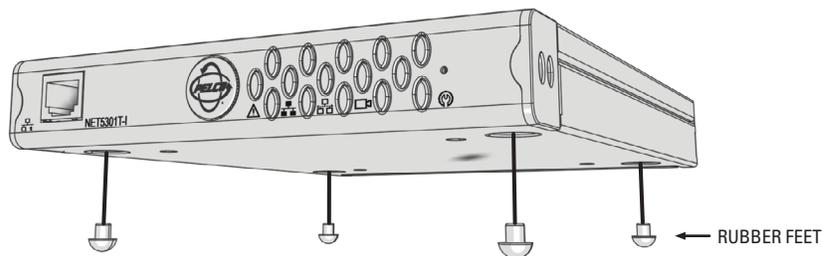
RUBBER FEET

Figure 4. Attaching Rubber Feet for Desktop Placement

2. Position the unit to allow for cable and power cord clearance at the front and rear panels.
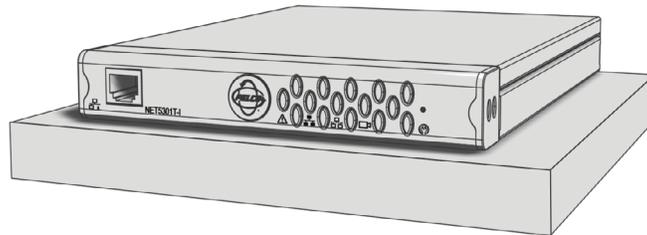
Figure 5. NET5301T-I Desktop Placement

⚠ **WARNINGS:**

- Do not place the NET5301T-I unit on its side; the unit could fall over and cause damage.
- Do not stack one NET5301T-I on top of another NET5301T-I or the units may overheat.

WALL MOUNTING

You can mount one NET5301T-I to a wall using the optional WM5001-4U wall mount base kit.

⚠ **WARNING:** Do not use any WM5001-4UEXP expansion units when mounting the NET5301T-I to a wall. Otherwise, the units may overheat.

To mount the NET5301T-I to a wall using the WM5001-4U:

1. Install the WM5001-4U wall mount base kit; refer to the WM5000 Series Wall Mount Kit Installation manual (C1616M).

2. Insert the NET5301T-I into the wall mount. Make sure all front and rear panel connectors are accessible.
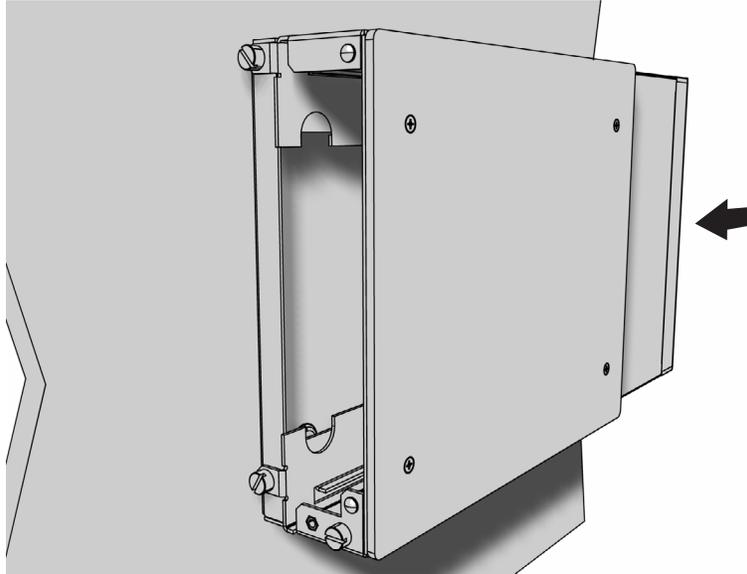
Figure 6. NET5301T-I and WM5001-4U Wall Mount

3. Tighten the thumbscrew on the wall mount to secure the unit (refer to Figure 7).

TIGHTEN
THUMBSCREW

Figure 7. Tighten the Thumbscrew to Secure the Unit

RACK MOUNTING

Any combination of encoder, decoder, and transcoder units can be mounted together in the optional RK5100PS-5U rack mount kit, up to 12 units. Each unit plugs directly into a power connector in the rack and is powered by the rack.

NOTES:

• To ensure proper rack ventilation, install a blank module (RK5001B-4U) in each empty slot.

• The RK5100PS-5U supplies only power. It does not provide a dock for any other unit connectors.

To mount the NET5301T-I into a rack mount kit:

1. Install the RK5100PS-5U rack mount kit into the rack; refer to the RK5100PS-5U Rack Mount Chassis Installation manual (C1615M).

2. Insert the NET5301T-I into the desired slot.
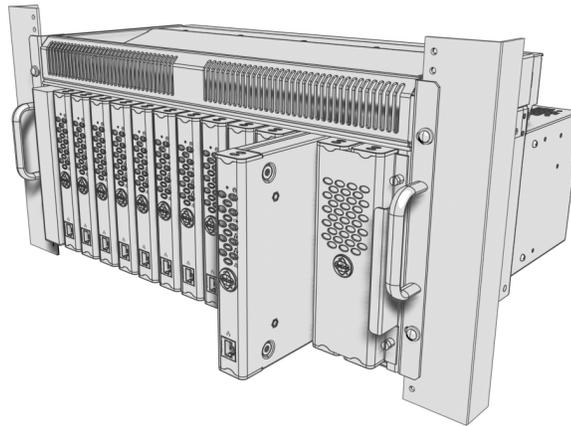
Figure 8. Multiple NET5301T-I Units in an RK5100PS-5U

3. Tighten the thumbscrew on the rack mount to secure the unit to the rack (refer to Figure 9).

TIGHTEN
THUMBSCREW
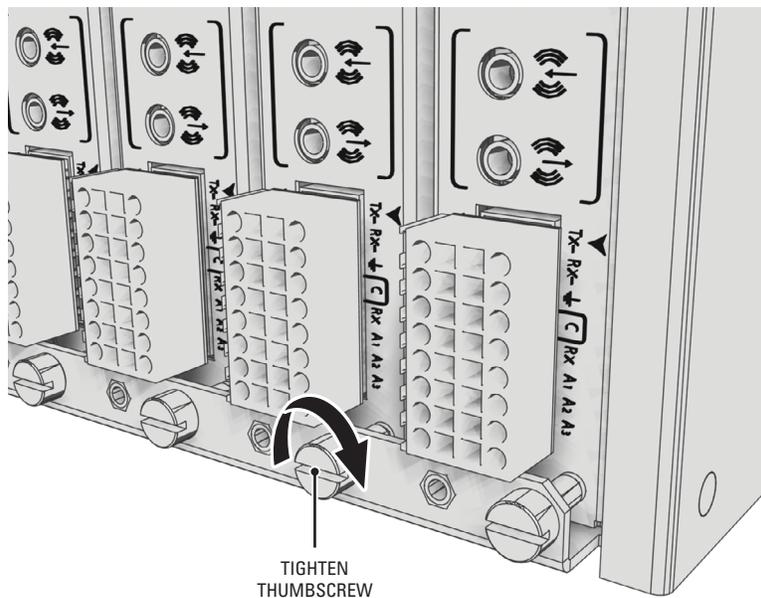
Figure 9. Tighten Thumbscrew to Secure the Unit

PELCO BADGE ORIENTATION

The Pelco badge on the front panel of the NET5301T-I can be rotated in quarter turns. If you install the unit on a flat surface, the Pelco badge will be turned the wrong way.

To rotate the Pelco badge:

1. Use the Pelco badge rotation sticker that came with the unit.

2. Attach the middle portion of the rotation sticker to the badge.

3. Press firmly with your thumb and rotate the badge to its correct position.

4. Remove the rotation sticker from the badge.
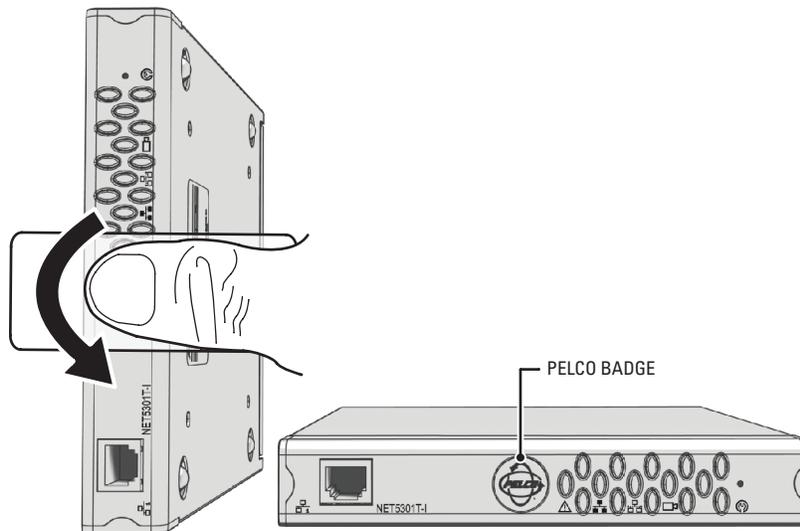
PELCO BADGE

Figure 10. Pelco Badge Orientation

Connections

Familiarize yourself with the NET5301T-I rear panel before connecting any equipment to the unit.
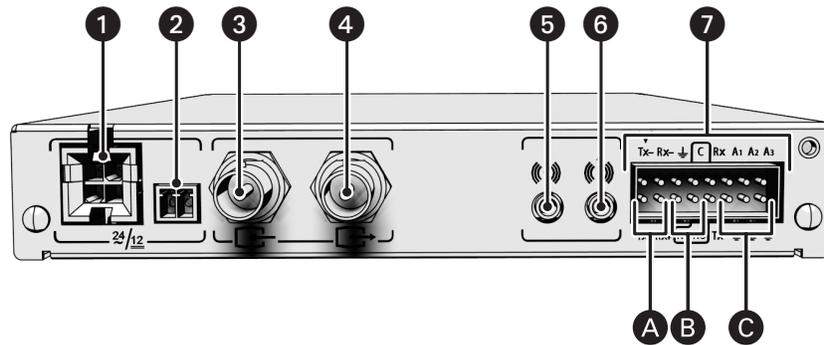
Figure 11. NET5301T-I Rear Panel

1. 4-Pin Power
2. 2-Pin Power
3. Video In
4. Video Out (Looping)
5. Audio In
6. Reserved
7. Terminal Block
   - A. PTZ Control (RS-422)
   - B. Relay Control
   - C. Alarm Input

CONNECTING VIDEO INPUT AND OUTPUT DEVICES

The NET5301T-I offers both analog video input and looping video output.

CAMERA
INPUT ONLY

LOOPING VIDEO
(OPTIONAL)
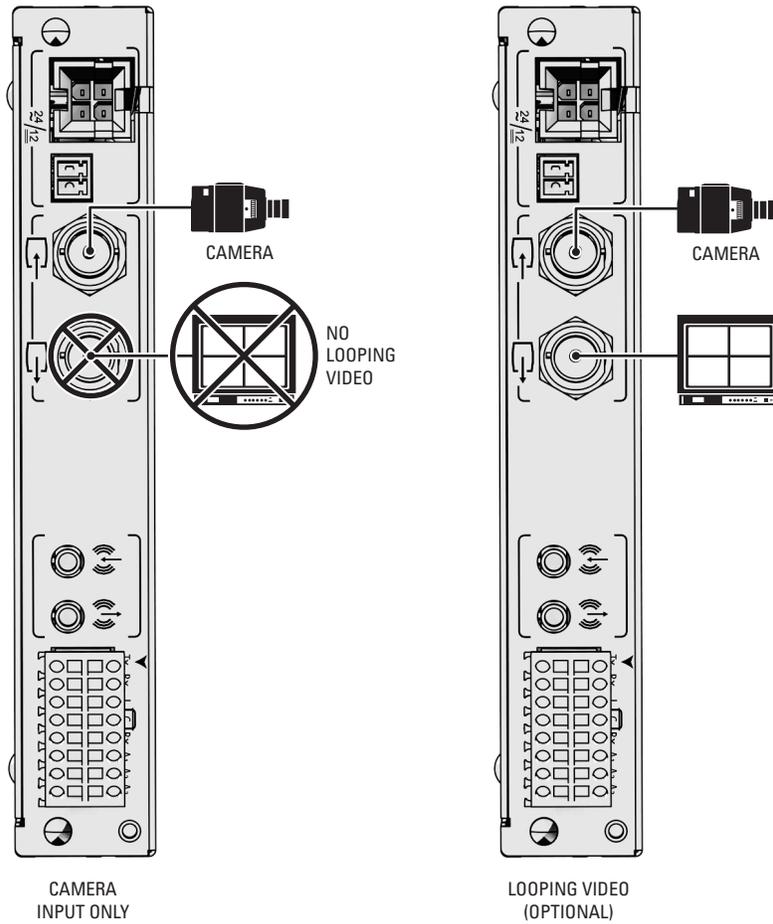
Figure 12. Video Input and Output

Before installing the NET5301T-I, make sure the distance from the unit to the video device is less than the maximum distance for the coaxial cable. Refer to Table A for maximum video coaxial cable distances.

Table A. Video Coaxial Cable Requirements

Cable Type*	Maximum Distance
RG59/U	750 ft (229 m)
RG6/U	1,000 ft (305 m)
RG11/U	1,500 ft (457 m)

*Cable requirements:
    75-ohm impedance
    All-copper center conductor; steel-center conductor cable may result in poor performance
    All-copper braided shield with 95% braid coverage

CONNECTING VIDEO INPUT

The NET5301T-I automatically detects the video standard (PAL or NTSC) and accepts both color and black-white analog video.

To connect video input:

1. Connect a coaxial cable to the camera or other analog video source.

2. Connect the coaxial cable to the video in connector on the rear panel.

3. If not using looping video, enable termination for the NET5301T-I on the Endura workstation. Termination is enabled by default.

The unit supports Coaxitron up-the-coax operation to a PTZ device. When the NET5301T-I receives a camera control command, it transmits that command up the coaxial cable to the PTZ device. Since Coaxitron is a single-direction protocol, the PTZ device cannot return any data to the unit. By default, Coaxitron is disabled.

This unit also supports a serial PTZ device that uses the Pelco P or Pelco D protocol, such as the Spectra® dome. Connect the coaxial cable from the device. Then refer to *Connecting a PTZ Device (Pelco P/Pelco D)* on page 20 to connect the camera control leads.

CONNECTING LOOPING VIDEO

The NET5301T-I supports looping video. It passes the video input to a monitor or other analog video device.

NOTE: Looped video only shows the camera video input. It does not include any behavior graphics.

To use looping video:

1. Connect a coaxial cable to the video out connector on the rear panel.

2. Connect the other end of the coaxial cable to the analog device.

3. Disable termination for the NET5301T-I on the Endura workstation. Termination is enabled by default.

4. If looping video to additional devices, disable termination on each device. Enable termination on the last device.

NOTE: If you do not terminate the video signal on the last device in the series, ghosting or other imperfections may appear in the video signal.

CONNECTING AUDIO

The NET5301T-I supports one audio input. The unit encodes audio and video signals simultaneously. This lets you listen to activity in the target area.

The unit supports both microphone and line input levels.

MICROPHONE
INPUT

LINE
INPUT

AUDIO PREAMP
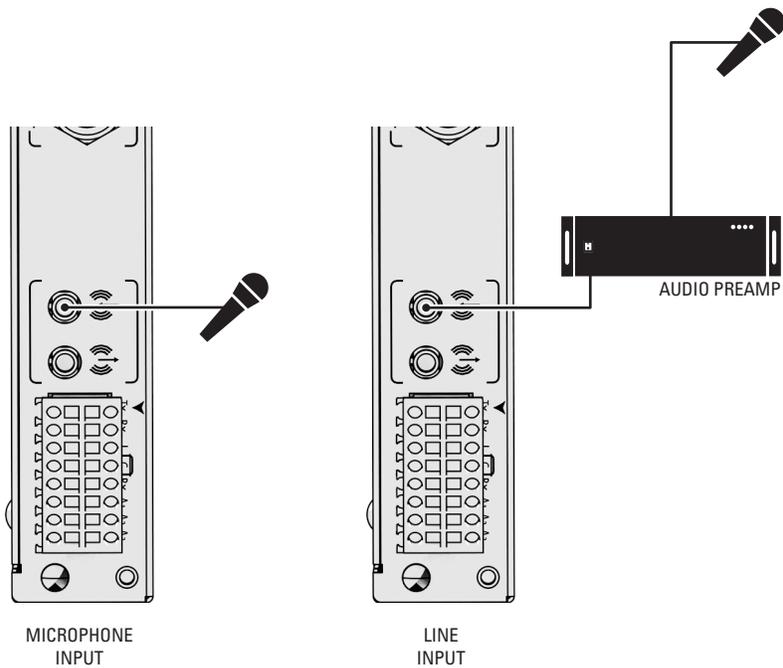
Figure 13. NET5301T-I Audio Connections

To implement audio:

1. Select the type of audio signal:

    Mic/Spkr: Switch to Mic/Spkr to connect a microphone. The microphone input level is 5 mVp-p.

    Line: Switch to Line to connect an amplified audio input device. The line input level is 1 Vp-p (0 dBV) nominal, 1.228 Vp-p (+4 dBU) maximum. By default, the switch is set to Line.

2. Wire the input audio connector. Connect the signal high lead to the connector tip. Connect the common lead to the connector sleeve.

3. Connect a line input device or microphone to the blue 3.5 mm audio input monaural connector. A preamplified microphone is recommended.

NOTES:

- If the switch setting does not match your audio equipment, audio distortion problems may occur.
- Audio output is not supported at this time.

CONNECTING A PTZ DEVICE, RELAY, AND ALARMS

The NET5301T-I incorporates a 16-pin terminal block to support the following:

- PTZ device, such as a dome camera, using the Pelco P or Pelco D protocol (RS-422)
- Relay control, either normally open or normally closed
- Up to three alarm inputs, supervised or unsupervised, using any combination of high and low signals

The terminal block has tension clamps instead of screw terminals. Use a small screwdriver to open the clamp for a particular lead. Figure 14 shows how to wire the terminal block and connect it to the NET5301T-I.

NOTE: The terminal block is keyed. It attaches only one way to the video encoder.
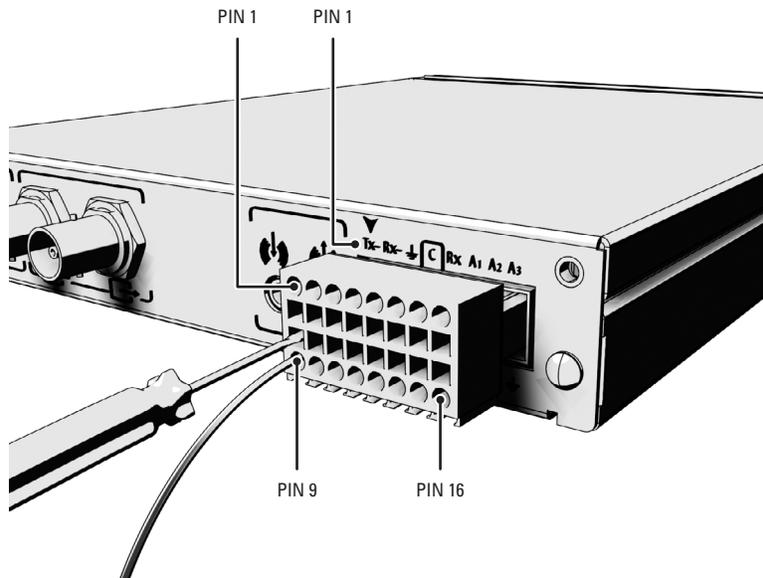
Figure 14. NET5301T-I Terminal Block

Table B identifies the pin assignments for the terminal block. An arrow on the rear panel identifies pin 1; on the terminal block, pin 1 is the left-most lead on the top row (refer to Figure 14).

Table B. PTZ, Relay, and Alarm Pin Assignments

Top Row				Bottom Row		
Pin	**Label**	**Lead**		**Pin**	**Label**	**Lead**
1	TX-	RS-422 Data TX-		9	TX+	RS-422 Data TX+
2	RX-	RS-422 Data RX-		10	RX+	RS-422 Data RX+
3	⏚	Ground		11	NC	Relay Normally Closed
4	C	Relay Common		12	NO	Relay Normally Open
5	RX	Reserved		13	TX	Reserved
6	A_1	Alarm 1		14	⏚	Ground
7	A_2	Alarm 2		15	⏚	Ground
8	A_3	Alarm 3		16	⏚	Ground

CONNECTING A PTZ DEVICE (PELCO P/PELCO D)

NOTE: To connect a Coaxitron PTZ device, refer to *Connecting Video Input* on page 17.

The NET5301T-I supports serial camera control using Pelco P or Pelco D (RS-422) for a PTZ device. You can connect only one serial PTZ device to a video encoder. The default Pelco P/Pelco D device address is 1.

When the NET5301T-I receives a camera control command, it transmits that command to the PTZ device. In 4-wire installations, the encoder also receives data from the PTZ device, including camera status and alarm states. It then transmits that data to the command center.

Figure 15 shows how to wire the NET5301T-I to a Spectra dome (refer to Table B on page 19 for the specific connector pin assignments).

NOTE: When connecting a PTZ device to the NET5301T-I, connect the TX+ and TX- leads to the RX+ and RX- leads between the encoder and the PTZ device.

By default, the encoder identifies any PTZ device as a fixed camera. You must configure the encoder before you can use the PTZ device; refer to the Endura WS5000 Advanced System Software Operation manual (C1624M).
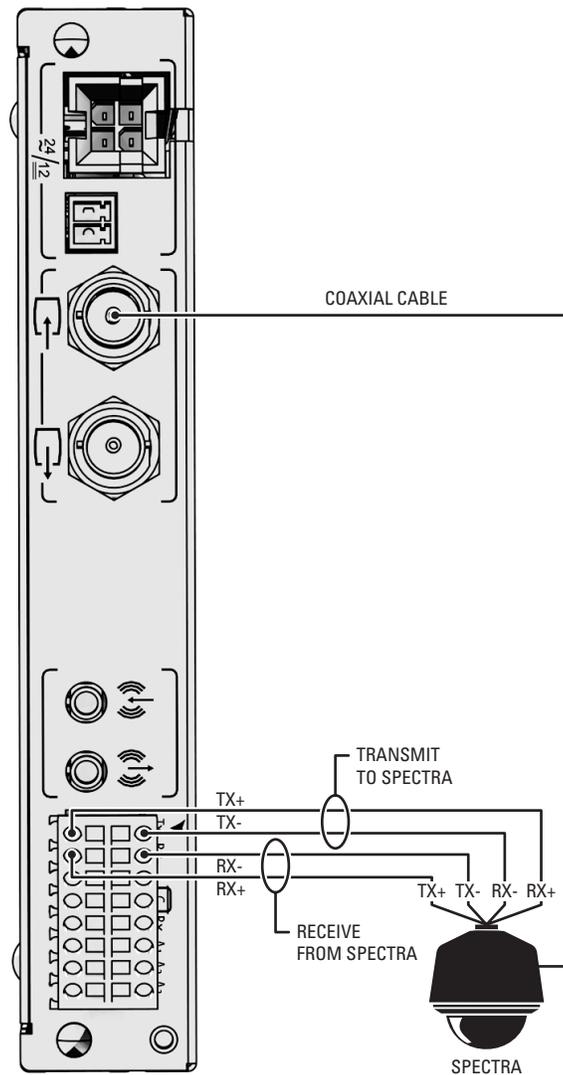
Figure 15. Connecting a Spectra Dome

Refer to Table C when installing the PTZ device. It lists the serial port settings that the NET5301T-I supports.

Table C. Serial Port Options and Defaults

Setting	Options	Default
Data rate (bits per second)	110, 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400	2400
Data bits	5, 6, 7, 8	8
Parity	None, Odd, Even	None
Stop bits	1, 2	1

CONNECTING A RELAY DEVICE

The NET5301T-I has an output for triggering an external device. It supports both momentary and continuous relay operation.

You can operate the relay interactively, during an active connection, or automatically to coincide with certain events. Typical applications include activating a door, gate or lock, or switching on lights or other electrical devices.

⚠ **WARNING:** Do not exceed the maximum rating of 30 VDC, 1 A.

Figure 16 shows how to wire the relay with its power source to the video encoder (refer to Table B on page 19 for the specific connector pin assignments).
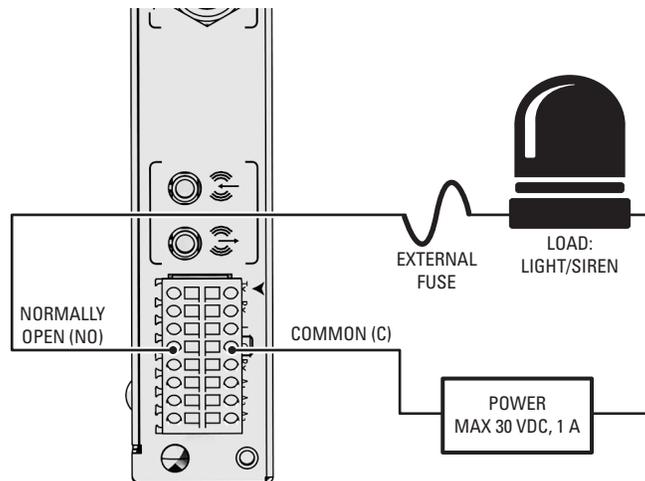
Figure 16. Connecting a Relay Device

CONNECTING ALARMS

The NET5301T-I offers three alarm inputs for external signaling devices, such as door contacts or motion detectors. Each encoder supports both normally open and normally closed devices. Each encoder also supports both supervised and unsupervised alarms.

Once configured, an alarm input can invoke many different activities, including triggering a relay device, sending an alert to a security office, changing the video recording settings, and storing pre-alarm video to an Endura video recorder. You can connect switches or contacts directly to the unit without a separate power supply.

Supervised Alarms

When an alarm is configured as a supervised alarm, the NET5301T-I maintains a constant electrical current through the alarm circuit (3.3 VDC, 1 kohms). If the alarm circuit length changes, due to an electrical short or a bypass, the voltage fluctuates from its normal state. Therefore, the unit triggers an alarm.

NOTE: Install the 1-kohm resistor as close to the switch as possible.

Figure 17 illustrates the alarm and no alarm conditions of a supervised alarm input. Whether the alarm is normally closed or normally open, neither a cut nor a bypass can defeat these alarms.
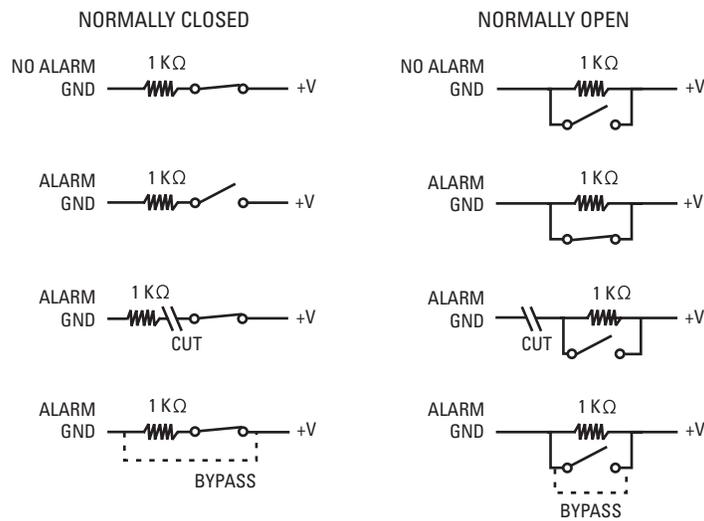
Figure 17. Supervised Alarm Conditions

Figure 18 illustrates the wiring configuration for supervised alarm inputs.

NORMALLY CLOSED

NORMALLY OPEN
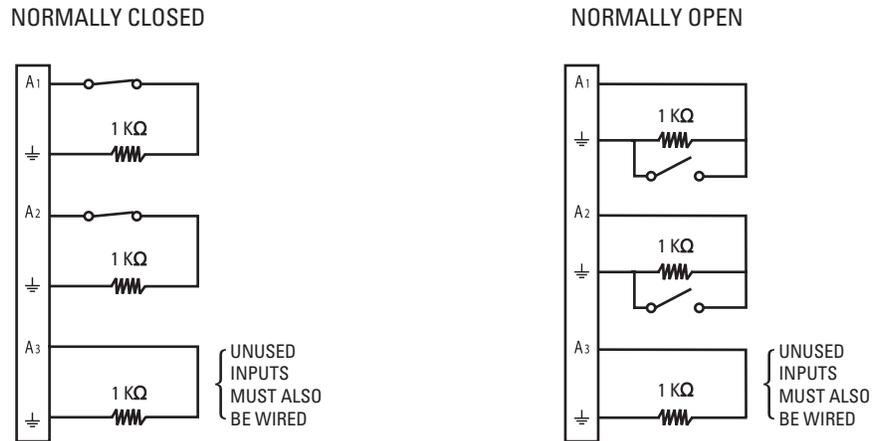
Figure 18. Supervised Alarm Input Wiring

Unsupervised Alarms

When an alarm is configured as an unsupervised alarm, the NET5301T-I only triggers an alarm when the normal alarm state (open or closed) changes.

Figure 19 illustrates the alarm and no alarm conditions of an unsupervised alarm input. A normally closed alarm input can be defeated with a bypass. A normally open input can be defeated with a cut.

NORMALLY CLOSED

NORMALLY OPEN
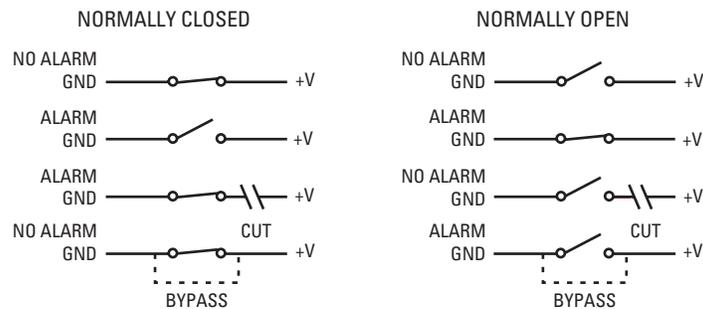
Figure 19. Unsupervised Alarm Conditions

Figure 20 illustrates the wiring configuration for unsupervised alarm inputs.

NORMALLY CLOSED

NORMALLY OPEN
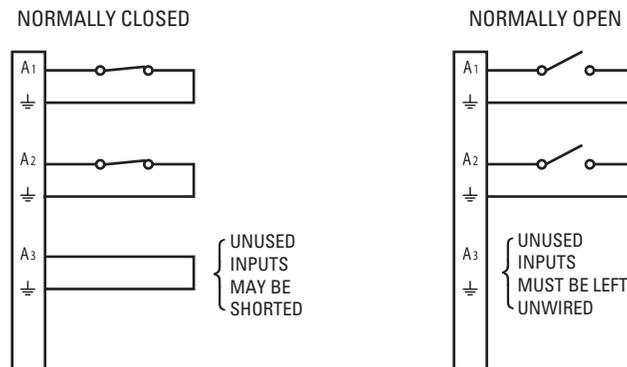
Figure 20. Unsupervised Alarm Input Wiring

Alarm Connections

Figure 21 shows how to wire the video encoder to an alarm (refer to Table B on page 19 for the specific connector pin assignments).
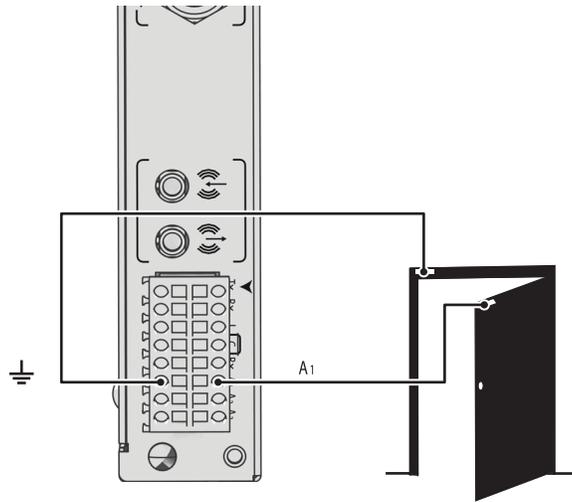
Figure 21. Connecting Alarms

CONNECTING TO THE NETWORK

Connect the NET5301T-I video encoder to the Endura network:

1. Connect a Cat5e (or better) cable to the network connector on the front panel.

2. Connect the other end of the network cable to a 100BASE-T (or better) port on the Endura network switch.
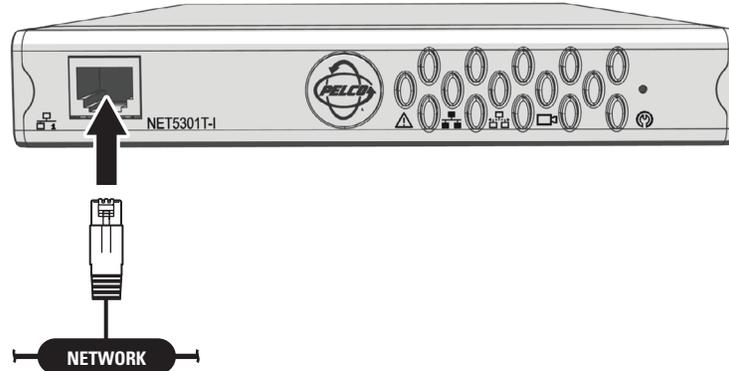
Figure 22. Connecting the NET5301T-I to the Endura Network

After you apply power to the encoder (refer to *Connecting Power* on page 25), the encoder automatically searches the Endura network for other Endura components. Also, the indicators on the front panel show network connection speed and status (refer to *Front Panel Indicators* on page 27).

CONNECTING POWER

The NET5301T-I video encoder is designed to operate from either a 12 VDC or a 24 VAC power supply. It automatically senses power type and polarity (DC).

The NET5301T-I can be powered from many sources:

- NET5301PS power supply connects directly to the 4-pin connector on the NET5301T-I rear panel.
- The RK5100PS-5U rack mount kit supplies power through the 4-pin connector on the NET5301T-I rear panel as soon as the unit slides into place.
- The Pelco MCS (B model), WCS (B model), and TF Series power supplies provide power through a 2-pin terminal block (supplied) that plugs into the 2-pin connector on the NET5301T-I rear panel.
- Other UL Listed direct plug-in power units marked "Class 2" and rated for 12 VDC ±10% or 24 VAC ±10% provide power through a 2-pin terminal block (supplied) that plugs into the 2-pin connector on the NET5301T-I rear panel.

The power consumption of the NET5301T-I is 14.5 W (24.2 VA).

Use Table D to help identify the necessary wire gauge and maximum cable distance. This table applies to 2-conductor solid copper wire. (Reduce distance by 10 percent for stranded copper wire.) These maximum distances are based on a maximum allowable voltage drop of 10 percent.

Table D. Recommended Wire Gauge and Maximum Wiring Distances

Wire Gauge	Maximum Distance	
	12 VDC	24 VAC
20 AWG (0.5 mm^2)	49 ft (14 m)	196 ft (59 m)
18 AWG (1.0 mm^2)	78 ft (23 m)	312 ft (95 m)
16 AWG (1.5 mm^2)	124 ft (37 m)	496 ft (151 m)
14 AWG (2.5 mm^2)	197 ft (60 m)	788 ft (240 m)
12 AWG (4.0 mm^2)	312 ft (95 m)	1,251 ft (381 m)
10 AWG (6.0 mm^2)	496 ft (151 m)	1,986 ft (605 m)

Connect power to the NET5301T-I. The Pelco badge (blue) and the status light (green) on the front panel should glow.

4-PIN OR 2-PIN
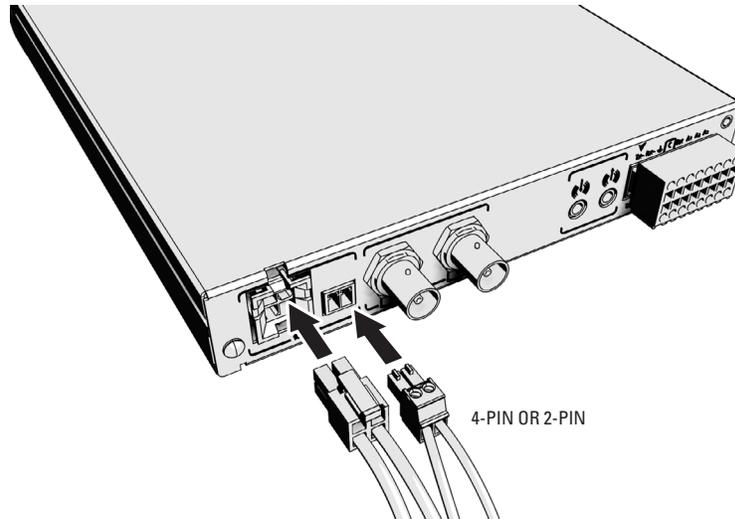
Figure 23. Connecting Power

CONFIGURING INTELLIGENT ENCODER BEHAVIORS

After you install the NET5301T-I intelligent video encoder, you can install one or more optional intelligent encoder behaviors (refer to *Optional Behaviors* on page 7 for available intelligent encoder behaviors and licenses).

Each optional behavior package includes the following items:
- One NET5301T-I behavior installation CD, including product label with license registration number
- One behavior license manager manual
- One behavior installation manual

NOTE: You can install more than one behavior on a single NET5301T-I. However, the encoder can only operate one behavior at a time.

To configure an intelligent encoder behavior, perform the following general steps:

1. Insert the NET5301T-I behavior installation CD into any Endura workstation on the Endura network.

2. Use the license manager software to install the behavior onto the appropriate NET5301T-I units; refer to the Intelligent Encoder License Manager manual (C3610M).

3. Configure the behavior for all appropriate NET5301T-I units from the Endura workstation.

Refer to the appropriate behavior installation manual for specific installation and configuration steps.

Operation

Refer to the Endura WS5000 Advanced System Software Operation manual (C1624M) for details on how to access and configure the NET5301T-I video encoder.

FRONT PANEL INDICATORS
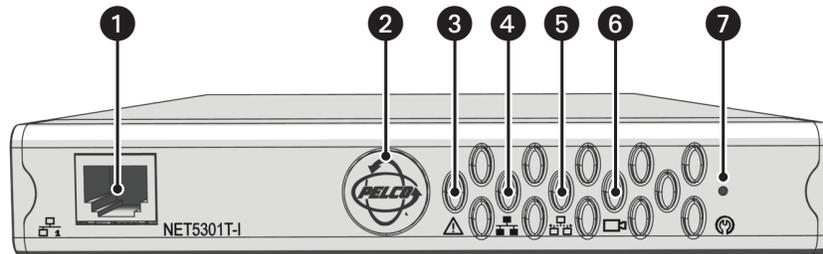
Figure 24. NET5301T-I Front Panel

❶	Network Connector	❺	Network Activity
❷	Power Indicator	❻	Video Presence
❸	Unit Status	❼	Reserved
❹	Network Status		

Pelco badge (power): The Pelco badge glows blue when the unit has power.

⚠ **Unit status:** Unit status is indicated by one of the following three colors:

Green: The unit is functioning normally.

Amber: The unit is in configuration mode.

Red: The unit is in an error condition.

Network status: Network status (connection and speed) is indicated by one of the following conditions:

Off: The unit is not connected to the network.

Solid amber: The unit is connected to the network using the 100BASE-T standard.

Solid red: The unit is connected to the network using the 10BASE-T standard.

NOTE: The NET5301T-I always uses the 100BASE-T standard. If the network status light is red, contact your network administrator or Endura certified technician.

Network activity: The network activity indicator flashes whenever the video encoder is sending or receiving network data.

Video presence: Video presence is indicated by one of the following conditions:

Green: Camera video is present at the video in connector.

Red: There is no video; the camera is not functioning properly.

Troubleshooting

If the following instructions fail to solve your problem, contact Pelco Product Support at 1-800-289-9100 (USA and Canada) or 1-559-292-1981 (international) for assistance.

Access the properties windows for the NET5301T-I video encoder on the Endura workstation; refer to the Endura WS5000 Advanced System Software Operation manual (C1624M).

- **Unit serial number:** Located on the Properties window and on the product label
- **Unit firmware version:** Located on the Advanced Properties window, listed for the Encoder Device

NOTE: Do not try to repair the unit yourself. Opening it immediately voids any warranty. Leave maintenance and repairs to qualified technical personnel. Exchange the defective unit and return it for repair.

Table E. Troubleshooting the NET5301T-I

Problem	Possible Causes	Suggested Remedy
Front panel indicators not lit.	Power turned off.	Check the power supply.
Network connection problem.	Faulty network connections.	Visually inspect all network cables and connectors at the unit and the network switch.
		Check the indicators on the network switch.
	Unit has connected at 10BASE-T.	Contact your network administrator or Endura-certified technician.
	Other network connectivity issues.	Contact your network administrator or Endura-certified technician.
No video transmission.	Faulty cable connections.	Check all leads, plugs, contacts, and connections.
	Defective camera.	Connect local monitor and check camera function.
	Defective encoder.	Check camera on a different encoder.
Poor analog video or ghosting.	Termination switch not set correctly.	From an Endura workstation: • Disable video termination for looping video. • Enable video termination for no looping video.
No looping video on local monitor.	Termination switch not set correctly.	From an Endura workstation, disable video termination.
	Faulty cable connections.	Check all leads, plugs, contacts, and connections.
No audio transmission to receiver.	Audio switch not set correctly.	Change the audio input setting for the NET5301T-I on the Endura workstation. Select Mic for microphone input. Select Line for line input.
	Faulty cable connection.	Check all leads, plugs, contacts, and connections.
	Defective audio devices or connections.	Troubleshoot all connected audio devices.
		Connect different audio hardware and check audio function.
	Defective encoder.	Check audio devices on a different encoder.
Cannot control PTZ cameras or other devices.	Camera protocol setting does not match encoder protocol setting.	Change the protocol setting for the camera on the Endura workstation.
		Change the camera to the correct protocol setting.
	Other PTZ settings are not correct.	Change the camera settings on the Endura workstation.
	Faulty camera control cable connections.	Check all cable connections. Make sure all plugs are properly plugged in.
The unit is not ready for operation after firmware upload.	Voltage failure during programming of update file.	Replace the device and have it checked by Pelco.

Specifications

MODEL NUMBER

NET5301T-I   Network video encoder that supports sophisticated object and activity detection behaviors, which simultaneously encodes video, audio, and control data for transmission over an IP network

SUPPLIED ACCESSORIES

Mating Connectors	1, 16-pin
	1, 2-pin

SYSTEM

Operating System	Linux®
User Interface	Remote operation from Endura workstation or VCD5000

VIDEO/AUDIO

Video Standards	NTSC/PAL/EIA/CCIR composite	
Video Coding	MPEG-4	
Video Streams	2, simultaneous	
Video Resolutions	NTSC	PAL
4CIF	704 x 480	704 x 576
2CIF	704 x 240	704 x 288
CIF	352 x 240	352 x 288
QCIF	176 x 120	176 x 144
Video Inputs/Connector Type	1, BNC, looping, 75 ohms, 1 Vp-p	
Audio Encoding	G.711 speech codec	
Audio Bit Rate	64 kbps	
Audio Levels		
Line In	1 Vp-p (0 dBV) nominal, 1.228 Vp-p (+4 dBu) maximum, 10 kohms	
Microphone	5 mVp-p, approximately 40 kohms	
Audio Connectors	2, 3.5 mm monaural	
Connector Tip	Signal high (input)	
Connector Sleeve	Common	
Audio Input	Microphone or line in	

PTZ CONTROL

PTZ Interface	RS-422, video in
PTZ Protocols	Pelco P/Pelco D (RS-422), Coaxitron

ALARMS/RELAYS

Alarm Inputs	3, programmable, 3.3 VDC, 1 kohms, triggered; uses 6 of 16 pins on terminal block connector
Relay Output	1, form-C relay, 30 VDC, 1 A; uses 3 of 16 pins on terminal block connector

VIDEO ACTIVITY DETECTION

Zones	3 plus 1 background zone
Zone Types	Any shape, user-definable in 16 x 16 pixel blocks
Sensitivity/Threshold	Adjustable per zone
Video Analytics	Refer to *Optional Behaviors* on page 7

AUXILIARY INTERFACES

Serial	Pelco P/Pelco D protocols (RS-422); uses 4 of 16 pins on terminal block connector
Terminal Block Connector	16-pin: Pelco P/Pelco D protocols (RS-422), 3 alarm inputs, 1 relay output

FRONT PANEL INDICATORS/FUNCTIONS

Network	RJ-45, 10/100BASE-T
Power	Blue
Status	Green, amber, red
Network Link/Speed	Amber, red
Network Activity	Green
Video	Green, red

POWER

Power Consumption	14.5 W, 50 BTU/H
Power Input	12 VDC ±10%
	24 VAC ±10%
Power Connectors	
4-Pin	For RK5100PS-5U or NET5301PS
2-Pin	For user-supplied power supply

ENVIRONMENTAL

Operating Temperature	41° to 95°F (5° to 35°C) at unit air intake
Storage Temperature	-40° to 149°F (-40° to 65°C)
Operating Humidity	20% to 80%, noncondensing
Maximum Humidity Gradient	10% per hour
Operating Altitude	-50 ft to 10,000 ft (-16 m to 3,048 m)
Operating Vibration	0.25 G at 3 Hz to 200 Hz at a sweep rate of 0.5 octave/minute

NOTE: The temperature at the unit air intake can be significantly higher than room temperature. Temperature is affected by rack configuration, floor layout, air conditioning strategy, and other issues. To prevent performance failure and unit damage, make sure the temperature at the unit is continuously within the operating temperature range.

PHYSICAL

Construction	Sheet metal
Finish	Gray metallic with black end caps, black matte finish
Dimension	8.75" D x 6.5" W x 1.2" H
	(22.2 x 16.5 x 3.0 cm)
Mounting	Desktop (feet), wall, or rack with options
Unit Weight	2.0 lb (0.9 kg)

STANDARDS/ORGANIZATIONS

- Pelco is a member of the MPEG-4 Industry Forum
- Pelco is a member of the Universal Plug and Play (UPnP) Forum
- Pelco is a member of the Universal Serial Bus (USB) Implementers Forum
- Pelco is a contributor to the International Standards for Organization/Electrotechnical Commission (ISO/IEC) Joint Technical Committee 1 (JTC1), "Information Technology," Subcommittee 29, Working Group 11
- Compliance, ISO/IEC 14496 standard (also known as MPEG-4)
- Compliant with International Telecommunication Union (ITU) Recommendation G.711, "Pulse Code Modulations (PCM) of Voice Frequencies"

(Design and product specifications subject to change without notice.)

PRODUCT WARRANTY AND RETURN INFORMATION

WARRANTY

Pelco will repair or replace, without charge, any merchandise proved defective in material or workmanship **for a period of one year** after the date of shipment.

Exceptions to this warranty are as noted below:

- Five years on fiber optic products and TW3000 Series unshielded twisted pair transmission products.
- Three years on Spectra® IV products.
- Three years on Genex® Series products (multiplexers, server, and keyboard).
- Three years on Camclosure® and fixed camera models, except the CC3701H-2, CC3701H-2X, CC3751H-2, CC3651H-2X, MC3651H-2, and MC3651H-2X camera models, which have a five-year warranty.
- Three years on PMCL200/300/400 Series LCD monitors.
- Two years on standard motorized or fixed focal length lenses.
- Two years on Legacy®, CM6700/CM6800/CM9700 Series matrix, and DF5/DF8 Series fixed dome products.
- Two years on Spectra III™, Esprit®, ExSite®, and PS20 scanners, including when used in continuous motion applications.
- Two years on Esprit and WW5700 Series window wiper (excluding wiper blades).
- Two years (except lamp and color wheel) on Digital Light Processing (DLP®) displays. The lamp and color wheel will be covered for a period of 90 days. The air filter is not covered under warranty.
- Eighteen months on DX Series digital video recorders, NVR300 Series network video recorders, and Endura® Series distributed network-based video products.
- One year (except video heads) on video cassette recorders (VCRs). Video heads will be covered for a period of six months.
- Six months on all pan and tilts, scanners or preset lenses used in continuous motion applications (that is, preset scan, tour and auto scan modes).

Pelco will warrant all replacement parts and repairs for 90 days from the date of Pelco shipment. All goods requiring warranty repair shall be sent freight prepaid to Pelco, Clovis, California. Repairs made necessary by reason of misuse, alteration, normal wear, or accident are not covered under this warranty.

Pelco assumes no risk and shall be subject to no liability for damages or loss resulting from the specific use or application made of the Products. Pelco's liability for any claim, whether based on breach of contract, negligence, infringement of any rights of any party or product liability, relating to the Products shall not exceed the price paid by the Dealer to Pelco for such Products. In no event will Pelco be liable for any special, incidental or consequential damages (including loss of use, loss of profit and claims of third parties) however caused, whether by the negligence of Pelco or otherwise.

The above warranty provides the Dealer with specific legal rights. The Dealer may also have additional rights, which are subject to variation from state to state.

If a warranty repair is required, the Dealer must contact Pelco at (800) 289-9100 or (559) 292-1981 to obtain a Repair Authorization number (RA), and provide the following information:

1. Model and serial number
2. Date of shipment, P.O. number, Sales Order number, or Pelco invoice number
3. Details of the defect or problem

If there is a dispute regarding the warranty of a product which does not fall under the warranty conditions stated above, please include a written explanation with the product when returned.

Method of return shipment shall be the same or equal to the method by which the item was received by Pelco.

RETURNS

In order to expedite parts returned to the factory for repair or credit, please call the factory at (800) 289-9100 or (559) 292-1981 to obtain an authorization number (CA number if returned for credit, and RA number if returned for repair).

All merchandise returned for credit may be subject to a 20% restocking and refurbishing charge.

Goods returned for repair or credit should be clearly identified with the assigned CA or RA number and freight should be prepaid. Ship to the appropriate address below.

If you are located within the continental U.S., Alaska, Hawaii or Puerto Rico, send goods to:

> Service Department
> Pelco
> 3500 Pelco Way
> Clovis, CA 93612-5699

If you are located outside the continental U.S., Alaska, Hawaii or Puerto Rico and are instructed to return goods to the USA, you may do one of the following:

If the goods are to be sent by a COURIER SERVICE, send the goods to:

> Pelco
> 3500 Pelco Way
> Clovis, CA 93612-5699 USA

If the goods are to be sent by a FREIGHT FORWARDER, send the goods to:

> Pelco c/o Expeditors
> 473 Eccles Avenue
> South San Francisco, CA 94080 USA
> Phone: 650-737-1700
> Fax: 650-737-0933

⊠Green   The materials used in the manufacture of this document and its components are compliant to the requirements of Directive 2002/95/EC.

This equipment contains electrical or electronic components that must be recycled properly to comply with Directive 2002/96/EC of the European Union regarding the disposal of waste electrical and electronic equipment (WEEE). Contact your local dealer for procedures for recycling this equipment.